

# Contents

<b>Preface</b>	<b>vii</b>	<b>Stable Isotopes</b>	
<b>Foreword</b>	<b>xv</b>	The Role of Bile in Essential Fatty Acid Absorption and Metabolism <i>Deanna M. Minich, Folkert Kuipers, Roel J. Vonk, and Henkjan J. Verkade</i>	43
<b>The Second Hugh Sinclair Memorial Lecture</b>		Measurement of Desaturase Activities by High-Precision Stable Isotope Mass Spectrometry <i>Hui-Min Su, Thomas N. Corso, and J. Thomas Brenna</i>	48
The Role Played by Microsomes and Peroxisomes in Regulating Unsaturated Fatty Acid Biosynthesis <i>Howard Sprecher, Qi Chen, B. Selma Mohammed, and Devanand L. Luthria</i>	1		
<b>The First Ulf S. von Euler Memorial Lecture</b>		Palmitic Acid Does Not Increase Lipoprotein Cholesterol Levels When the Diet Contains Recommended Levels of Linoleic Acid <i>S.L. Cook, S.D. Konrad, Y.K. Goh, M.A. French, and M.T. Clandinin</i>	50
Transcellular Biosynthesis of Eicosanoids in Circulation <i>Ryszard J. Gryglewski</i>	7		
<b>Models in Cell Culture</b>		<b>Gene Expression of Eicosanoids</b>	
Docosahexaenoic Acid Metabolism and Function in the Central Nervous System: Studies with Cell Culture Model Systems <i>Arthur A. Spector, Steven A. Moore, and Mark A. Yorek</i>	16	Fatty Acid Substrate Interactions with Prostaglandin Endoperoxide H Synthases <i>William L. Smith, Caroline Jill Rieke, Elizabeth D. Thuresson, Anne M. Mulichak, and R. Michael Garavito</i>	56
Preferential Uptake of Long-Chain Polyunsaturated Fatty Acids by Human Placental Cells <i>Fiona M. Campbell, Anna M. Clohessy, Margaret J. Gordon, and Asim K. Dutta-Roy</i>	19	Cyclooxygenase Expression in a Rat Model of Focal Cerebral Ischemia <i>O.A. Belton, R. Forde, H.P. Lorez, and D. Fitzgerald</i>	61
Eicosapentaenoic Acid and Docosahexaenoic Acid Inhibit Vascular Smooth Muscle Cell Proliferation Through Inhibition of G1/S Progression <i>Takashi Terano, Aizan Hirai, Yasushi Tamura, Masatoshi Kitagawa, and Yasushi Saito</i>	23	Cyclooxygenase Type-2 Selective Nonsteroidal Anti-Inflammatory Drugs for Inhibition of Preterm Labor <i>Donna M. Slater; Robert Sawdy, William J.B. Dennes, Victoria Allport, and Phillip R. Bennett</i>	64
Effects of n-3 Polyunsaturated Fatty Acids on Receptor-Mediated Ca <sup>2+</sup> Permeable Nonselective Cation Currents and Migration of Vascular Smooth Muscle Cells <i>Asano Michiko, Yukichi Okuda, Masakazu Mizutani, Seiji Suzuki, Kamejiro Yamashita, Masaaki Soma, Kuniaki Iwasawa, Hisanori Hazama, Masao Omata, and Toshiaki Nakajima</i>	27	Modification of Membrane Phospholipids with n-6 and n-3 Essential Fatty Acids Regulates the Gene Expression of Prostaglandin Endoperoxide Synthase Isoforms Upon Agonist-Stimulation <i>Kazushige Yokota, Kazutaka Tsuruhami, Kohji Nishimura, Tsutomu Nagaya, Mitsuo Jisaka, and Koichi Takinami</i>	68
Diol Lipids as Novel Compounds for n-6 and n-3 Fatty Acid Delivery to Cancer Cells <i>R. de Antueno, M. Elliot, M. Bai, J. Morton, P. Quiroga, M. Smith, T. Dowell, I? Redden, and D. Horrobin</i>	32	<b>Eicosanoid Receptors</b>	
Enhancement of Endothelial Permeability <i>In Vitro</i> by 12(S)-Hydroxyeicosatetraenoic Acid <i>H. Youmine, C.A.E. Martin, B. Saiag, and A.B. Legrand</i>	39	Recent Developments in the Classification of Prostanoid Receptors <i>Robert A. Coleman</i>	74

AGN 192093: A Novel Thromboxane A <sub>2</sub> Mimetic with Activity Consistent with Human Thromboxane Receptor Heterogeneity <i>D.F. Woodward, A.H.-I? Krauss, C.S. Spada, K.M. Kedzie, C.E. Fairbairn, H.A. Krauss, A.L. Nieves, C.E. Protzman, L.C. Shi, R.M. Burk, R.A. Coleman, N.S. Tilford, E Abbas, K. Marshall, and J. Senior</i>	78	Docosaehaenoic Acid Plus Arachidonic Acid Enhance Preterm Infant Growth <i>Deborah A. Diersen-Schade, James W. Hansen, Cheryl L. Harris, Kimberly L. Merkel, Karen D. Wisont, and Julia A. Boettcher</i>	123
Neuronal Stimulant Actions of Prostacyclin and Its Mimetics <i>Robert L. Jones and John A Rudd</i>	84	Does Dietary Docosaehaenoic Acid in Human Pregnancy Affect Offspring Brain Development: Opportunities for Research <i>Sjúrður F. Olsen, Jannie Dalby Salvig, and Niels J. Secher</i>	128
Molecular Pharmacology of the Prostaglandin E <sub>2</sub> Receptors that Elevate Cyclic AMP <i>Daniel W. Gill, Karen M. Kedzie, Alicia M. Bogardus, John E. Donello, Felix J. Kim, Heather A. Krauss, and David E Woodward</i>	88	Prostaglandin Metabolism in Developing Human Lung <i>Christine E. Conner; Rodney W. Kelly, and Robert Hume</i>	131
Reporter Gene-Based Functional Assays for Prostanoid Receptors: The Aequorin Luminescence Assay <i>Mark Abramovitz, Laila M.R. Singh, Mark D. Ungrin, Rino Stocco, and Kathleen M. Metters</i>	92	<b>Essential Fatty Acids and Infant Nutrition</b>	
Modulation of Prostaglandin Synthesis in Endothelial Cells and Fibroblasts by Corticotropin-Releasing Factor and Antagonists <i>Sigal Fleisher-Berkovich, Gilad Rimon, and Abraham Danon</i>	96	Are Long-Chain Polyunsaturated Fatty Acids Essential Nutrients in Infancy? <i>Maria Makrides and Robert A. Gibson</i>	136
Different Effects of Albumin on the Metabolism of Hydroxyeicosatetraenoic Acids in Human Platelets <i>Marina Dadaian and Pär Westlund</i>	99	Long-Chain Polyunsaturated Fatty Acid Requirements of Preterm Infants <i>Ricardo Uauy, Patricia Mena, and Norman Salem, Jr.</i>	141
<b>Essential Fatty Acids, Development in Utero, and Early Life</b>		A Randomized Trial of Arachidonic Acid Dose in Formulas Containing Docosaehaenoic Acid in Term Infants <i>Robert A. Gibson, Maria Makrides, Joanna S. Hawkes, Mark A Neumann, and Arthur R. Euler</i>	147
Fatty Acids in Pregnant Diabetic Women and Neonates: Implications for Growth and Development <i>K. Ghebremeskel, B. Thomas, Y. Min, E Stacey, E. Koukkou, C. Lowy, K. Erskine, M.A. Crawford, and B. Offley-Shore</i>	104	<b>DHA and the Brain</b>	
Estimating 22:6n-3 Synthesis in Human Pregnancy from Natural Variations in <sup>13</sup> C Abundance <i>I? Haggarty, J. Ashton, J.T. Brenna, T.N. Corso, V. Lakin, D.R. Abramovich, and I? Danelian</i>	108	Docosaehaenoic Acid-Containing Phospholipids Optimally Promote Rhodopsin Activation <i>Drake C. Mitchell and Burton J. Litman</i>	154
Polyunsaturated Fatty Acids, Thromboxane A <sub>2</sub> , and α-Fetoprotein in Intervillous Blood of Pregnant Women <i>C. Benassayag, T.M. Mignot, M. Haourigui, C. Civel, J. Hassid, B. Carbonne, E.A. Nunez, and E Ferre</i>	113	Abundance of Docosaehaenoic Acid in Bovine Retinal Microvessels <i>Marc Lecomte, Clarisse Paget, Daniel Ruggiero, Nicolas Wiernsperger; and Michel Lagarde</i>	159
Influence of Trepidil on Prostacyclin/Thromboxane Balance in Preeclampsia <i>J. Nieder; W. Augustin, and I? Claus</i>	118	Dietary n-3 Fatty Acid Manipulation and Retinal Function <i>Andrew J. Sinclair, Harrison S. Weisinger; and Algis J. Vingrys</i>	162
		<b>Diabetes</b>	
		Influences of Evening Primrose Oil on Lipid Metabolism and Functions of Sensory Nerves in Diabetic Rats: Role of the Metabolic Pool of Essential Fatty Acids <i>Peter O.O. Julu</i>	168

<b>Essential Fatty Acids and Eicosanoids, Inflammation, and the Immune Response</b>		Lipid Oxidation–Protein Interaction <i>In Vivo</i> <i>H.R. Knapp and Zhao Y. Guo</i>	212
Prostaglandins as Modulators of Lymphocyte-Mediated Inflammatory and Humoral Responses <i>Sarah G. Harris, Beth A. Graf, Kuljeet Kaur; Daniel A. Nazarenko, Josue Padilla, and Richard P. Phipps</i>	176	<b>Trans Polyunsaturated Fatty Acids</b>	
Long-Chain Fatty Acids for the Treatment of Inflammatory Bowel Disease <i>Andrea Beluzzi, Stefano Boschi, and Federico Miglio</i>	179	<i>Trans</i> Fatty Acids in the Perinatal Period <i>Berthold Koletzko and Thomas Berghaus</i>	216
Binding of Fatty Acids to Intracellular Fatty Acid Binding Protein Reduces 15-Lipoxygenase-Mediated Peroxidation <i>B.A. Ek-von Mentzer, J.A. Hamilton, and A.A. Spector</i>	182	<i>In Vitro</i> Hydrolysis of Polyunsaturated Fatty Acid N-Acyloxyalkyl Derivatives of Theophylline <i>Peter R. Redden, Michael J. Burke, Jo-Anne E. Douglas, Arthur J. Dick, and David F. Horrobin</i>	221
Dietary Oil Containing $\gamma$ -Linoleic Acid Attenuates Development of Lung Fibrosis in Hamsters <i>Vincent A. Zihoh, Monica Yun, Dallas M. Hyde, and Shri N. Giri</i>	186	Non-Methylene Interrupted Polyenoic Fatty Acids: Structural Characterization and Metabolism by Fatty Acid Chain Elongation System in Rat Liver <i>Tamotsu Tanaka, Toshinori Hattori, Maki Kouchi, Kaoru Hirano, and Kiyoshi Satouchi</i>	229
DHA-Facilitated Membrane Protein Clustering and T Cell Activation <i>Laura J. Janski, LaDawn Caldwell, Philip Jiricko, John Scherer; and William Stillwell</i>	191	Effects of <i>Trans</i> 20:4 and 20:5 Isomers on Rat Platelet Aggregation <i>C. Løi, O. Berdeaux, J.M. Chardigny, D. Poullain, J.P. Noel, and J.L. Sébédio</i>	234
<b>Oxidative Modification of Essential Fatty Acids: Real or Artifact?</b>		Distribution of Dietary <i>Trans</i> Isomers of Essential Fatty Acids in Blood Lipid Classes <i>N. Combe, A. Judde, C. Billeaud, C. Boue, F. Turon, B. Entressangles, D. Dallay, and J.J. Leng</i>	239
Formation of Novel Isoprostane-Like Compounds from Docosahexaenoic Acid <i>L. Jackson Roberts II and Jason D. Morrow</i>	197	<b>Essential Fatty Acids, Eicosanoids, and Vascular Disease</b>	
Increase in Pulmonary Artery Pressure Associated with Endogenous Release of the F <sub>2</sub> -Isoprostane 8-epi-PGF <sub>2</sub> $\alpha$ , <i>C. Larsson-Backström, L.E. Gustafsson, P. Westlund, G. Ciabattini, and C. Patrono</i>	200	Influence of Dietary n-3 Fatty Acid Supplementation on Coronary Artery Bypass Graft Patency <i>Jan Eritsland</i>	243
Bioavailability of Lipid Oxidation Products in Man <i>Martin J. Shepherd, Robert Wilson, J. Anne Payne, Rosemary Smith, and Rudolph A. Riemersma</i>	202	Eicosanoids and Vascular Endothelial Cell Functions <i>Sei-itsu Murota, Mitsue Onodera, Su-Ping Yang, Yaowei Zhang, Ikuko Sato-Suzuki, Toshie Kanayasu-Toyoda, and Ikuo Morita</i>	248
Antioxidant and Additional Biological Activities of Olive Oil Phenols <i>F. Visioli and C. Galli</i>	206	Effect of Eicosapentaenoic Acid on the Release of Endothelin-1 by Bovine Aortic Endothelial Cells <i>S. Jamin, B. Saiäg, M. Crabos, M. Catheline, H. Allain, L. Vernhet, H. Youmine, C. Martin, and A. Legrand</i>	252
Arachidonic Acid Hydroperoxides Prime Platelet Function via Cyclooxygenase Activation <i>Catherine Calzada, Evelyne Ve'ricel, Bérengère Mitel, and Michel Lugarde</i>	209	n-3 Fatty Acids as Supplement to Statins in the Treatment of Patients with Combined Hyperlipidemia <i>Arne Nordøy, Kaare H. Børnaa, Hugo Nilsen, Rolf K. Berge, John-Bjarne Hansen, and Ole-Christian Ingebretsen</i>	256

Dietary Docosahexaenoic Acid Lowers Plasma Triglycerides in the Absence of Dietary Eicosapentaenoic Acid in Human Males <i>G.J. Nelson, P.C. Schmidt, G. Bartolini, D.S. Kelley, and David Kyle</i>	262	Meglumine $\gamma$ -Linoleic Acid: An Intravesical Agent for Superficial Bladder Cancer? <i>L.Z. Solomon, A.M. Jennings, M.C. Hayes, P.S. Bass, B.R. Birch, and A.J. Cooper</i>	312
Does Dietary Linoleic Acid Attenuate the Efficacy of n-3 Fatty Acids in Suppressing Arachidonic Acid Metabolism? <i>Daniel Hwang and Donna Ryan</i>	268	<b>Alcohol: Focus on Essential Fatty Acids and Eicosanoids</b>	
Two Factors in Fats and Oils That Affect Survival Time of Stroke-Prone Spontaneously Hypertensive Rats—n-6/n-3 Ratio and Minor Components <i>Harumi Okuyama, Min-Zhao Huang, Makoto Miyazaki, Shiro Watanabe, Tetsuyuki Kobayashi, Akito Nagatsu, and Jinsaku Sakakibara</i>	273	Alcohol Consumption in Felines Increases Lipid Peroxidation in the Brain and Stimulates Polyunsaturated Fatty Acid Metabolism <i>Robert J. Pawlosky, Samir Gupta, and Norman Salem, Jr.</i>	317
Effects of Aging and Dietary Fat on $\beta$ -Adrenoceptors, L-type $\text{Ca}^{2+}$ Channels, Membrane Fatty Acids, and Ventricular Fibrillation in Rats <i>VE. Benediksdottir and S. Gudbjarnason</i>	277	Effect of Ethanol Exposure on Fetal Guinea Pig Brain Essential Fatty Acid Content <i>Graham C. Burdge and Anthony D. Postle</i>	321
Differential Effects of Antiarrhythmic Drugs on Platelet Aggregation, Arachidonic Acid Metabolism, and Inflammation <i>S.A. Saeed, S. Famaz, and A.H. Gilani</i>	280	Expression and Lipid Binding of Sterol Carrier Protein-2 and Liver-Fatty Acid-Binding Proteins: Differential Effects of Ethanol <i>In Vivo</i> and <i>In Vitro</i> <i>Nicolai A. Avdulov, Svetlana V. Chochina, Sean C. Myers-Payne, Timothy Hubbell, Urule Igbavboa, Friedhelm Schroeder, and W. Gibson Wood</i>	324
Antiarrhythmic Properties of n-3 Fatty Acids in Cardiomyocytes: A Role for Membrane Fluidity? <i>Edward J. McMurchie, Wayne R. Leifert, and Richard J. Head</i>	284	The Role of Prostaglandin E and Related Eicosanoids in Mediating the Effects of Ethanol <i>Frank R. George</i>	328
<b>Essential Fatty Acids, Eicosanoids in Cancer</b>		Significant Effects of Lithium- $\gamma$ -Linoleic Acid Supplementation in Severe Alcohol Dependence <i>E.M.T. Glen, L.E.E. MacDonell, F.K. Skinner; P.E. Ward, N. Brayshaw, and A.I.M. Glen</i>	331
Modulation of UVB (280–320 nm) Radiation-Induced Immunosuppression and Carcinogenesis in Skh:HR Hairless Mice by Dietary Fat <i>VE. Reeve, M. Bosnic, and C. Boehm-Wilcox</i>	290	The Phospholipid Bilayer Mediates the Effect of Primary Alcohols on Rhodopsin Activation <i>Drake C. Mitchell and Burton J. Litman</i>	336
Eicosapentaenoic Acid Attenuates Cachexia Associated with Advanced Pancreatic Cancer <i>Matthew D. Barber; Steven J. Wigmore, James A. Ross, and Kenneth C.H. Fearon</i>	294	<b>Schizophrenia</b>	
Tamoxifen Inhibits the Release of Arachidonic Acid in Estrogen Receptor Negative A549 Cells <i>Jamie D. Croxtall, John O. White, Qam Choudhury, and Rod J. Flower</i>	299	The Role of Brain Lipid Metabolism in Schizophrenia <i>David F. Horrobin</i>	
The Effects of n-6 Polyunsaturated Fatty Acids on the Expression of Metastasis Suppressors in Cancer Cells <i>Wen Jiang, Stephen Hiscox, Richard P. Bryce, David E Horrobin, and Robert E. Mansel</i>	303	Infant Feeding in Schizophrenia <i>Malcolm Peet, Jacqui Poole, and Jonathon D. E. Laugharne</i>	344
		Diminished Niacin-Induced Skin Flushing Reflects Low Arachidonic Acid Levels and May Provide a Diagnostic Test for Schizophrenia <i>P.E. Ward, J. Sutherland, E.M.T. Glen, and A.I.M. Glen</i>	349
		n-3 Polyunsaturated Fatty Acids in the Treatment of Schizophrenia <i>Malcolm Peet and Jan Mellor</i>	354

**Anandamide and Cannabinoid Receptors**

Cannabimimetic Fatty Acid Derivatives:  
Biosynthesis and Catabolism

*V. Di Marzo, L. De Petrocellis, T. Bisogno,  
D. Melck, and N. Sepe* 358

Pathways and Mechanisms of Anandamide  
Biosynthesis in Mammalian Systems

*Harald H.O. Schmid, Pafricia C. Schmid,  
and Toyoyasu Kuwae* 363

Reversible Catalyses of Anandamide AmidoHydrolase  
and Synthase in Porcine and Rat Tissues

*Shozo Yamamoto, Kazuhisa Kafayama,  
Yuko Kurahashi, Mitsujiro Suzuki, Hiroshi Suzuki,  
Natsuo Ueda, and Itsuo Katoh* 372

Characterization of Cannabinoid Receptors  
in the Spleen and in Mast Cells

*Ruth A. Ross, Vicki L. Murphy, Neil G. McKay,  
Michael L.J. Ashford, and Roger G. Pertwee* 376

Biosynthesis and Actions of Anandamide  
and 2-Arachidonoylglycerol: Two Endogenous  
Cannabimimetic Molecules

*Takayuki Sugiura, Sachiko Kondo, Tomoko Kodaka,  
Shinji Nakane, Atsushi Yamashita, Seishi Kishimofo,  
Keizo Waku, and Yoshio Ishima* 380

**Non-Mammalian Eicosanoids**

Allene Oxide Synthesis by a Natural  
Fusion Protein with Lipoxygenase  
and Catalase-Related Domains

*Alan R. Brash, Reef Koljak, Olivier Boutaud,  
Bih-Hwa Shieh, and Nigulas Samel* 385

Catalytic Properties of Linoleate Diol Synthase  
and a Comparison with PGH Synthase-1

*Ernst H. Oliw, Chao Su, and Margareta Sahlin* 389

Eicosanoids Produced by Nucleated Blood Cells  
of Poikilotherms Are Involved in Clotting

*Ceil A. Herman, Selene M. Virk, Xinying Wang,  
and Karsten Gronert* 395

Isolation of 15(S)-HETE and 11,14,15-  
Trihydroxyeicosatrienoic Acids from Garlic Roots

*Muslim Ali, Denis Reynaud,  
and Cecil R. Pace-Asciak* 400

Is Lipoxygenation of Membrane Lipids  
Implicated in Drought Damage to Higher Plants?

*Tankred Schewe, Hartmut Kühn,  
and Santosh Nigam* 403

Phospholipase B in *Penicillium notatum*

*Kunihiko Saito* 406

**Miscellaneous Contributions**

Diets and Fatty Acid Signatures  
of Whole Fish

*R.G. Ackman, P.E. Kirsch, and S.J. Iverson* 410

Effect of *Trans* Arachidonic Acid  
(20:4 $\Delta$ 17t) on Neutrophil Superoxide  
Anion Generation *In Vitro*

*W. Higgs, J-M. Chardigny, J-L. Sébédio,  
R. Wilson, and R. Armstrong* 415

Subject Index 421

Author Index 431